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Combat Crew

strategic air command

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JANUARY 1981

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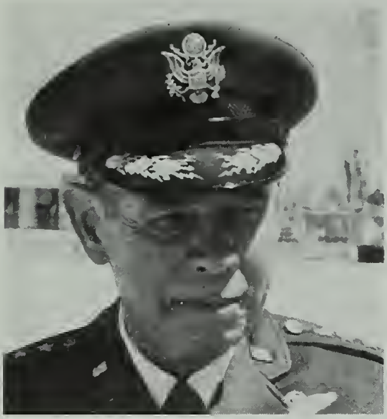
FROM THE CINC . . .

It is vain to imagine that the mere perception or declaration of right principles will be of any value unless they are supported by those instruments and agencies of force which in the last resort must be the defense of right and reason.
Sir Winston Churchill



General Richard H. Ellis
Commander in Chief, SAC

Simply and candidly stated, the business of our profession is war — deterring it for as long as possible . . . but fighting and winning it should deterrence fail.

Readiness for war remains the principal force in the deterrence of war and is the purpose for which SAC was created 35 years ago, come this March 21st. However, if the credibility of our strategic deterrent should ever become less than absolute, the possibility of challenge by the enemy would grow dramatically. Therefore, we must be prepared to fight. This is what readiness is all about . . . and it is a subject you should fully understand as we begin the second year of this critical decade.

Having watched the crews and support teams operate during GIANT VOICE, OLYMPIC ARENA, GIANT SWORD and other competitions — in addition to having reviewed the results of the exercises and evaluations we conduct and participate in — there is no doubt in my mind that the Command is ready to meet any challenge. However, what really counts is that our national leaders, our allies and, most important, the enemy know the men and women of the Strategic Air Command are prepared to do whatever is asked, whatever is necessary, to protect our Nation and its commitments around the world — with their lives, if necessary.

There are many dimensions to readiness, but three impact directly on the SAC combat crew force: they are equipment; plans and procedures; and people. Although much effort and the majority of media headlines are consumed by the first two, it is the *"people"* part of readiness that ultimately has the greatest effect on our ability to deter or respond to aggression.

SAC and the Air Force work hard to provide the crew force with modern, technically competitive weapon systems. Granted, America's strategic forces have suffered through a decade of neglect, but things are now starting to turn around. During the next decade, you should see across-the-board strategic modernization programs. For SAC, this will mean new weapon systems and new equipment: the M-X, ALCM, KC-10, OAS and DBNS for the B-52, the TR-1 and a new technology follow-on penetrating bomber. In addition, we hope to see an interim bomber for the mid-1980s, a reengined KC-135 fleet and the acceleration and expansion of the E-4 program. Despite these improvements, modern forces in and of themselves do not ensure readiness. Some type of state-of-the-art control apparatus must also exist.

The command control mechanisms to maintain the necessary readiness posture needed in today's geopolitical environment, as well as the plans by which we would employ our forces, have been and will continue to be in continual evolution. Your monthly EWO training should attest to this fact.

Since 1957, the Strategic Air Command has built the concept of alert into a strong, credible deterrent. Today, the conventional side of SAC's mission is also coming to the fore as our country's leaders recognize the potent capabilities of this far-reaching political and military instrument of national will. However, even if we buy new weapons and develop innovative ways to employ them, it is all for naught without the final element of the readiness equation . . . and that is where you come in.

The last dimension of readiness is "ready" people — that is, people who are technically competent to perform the job; physically competent to withstand the strain and hardships of the mission; and mentally competent to understand what they do and why they must do it.

In SAC, this translates into the professional quality that has sustained and become the hallmark of the Command: discipline — unbending and absolute. Personal and professional discipline is an attitude — a state of mind — and it starts at the very top of an organization and reaches out to every man and woman in the field. It is an unbroken chain of responsibility upon which the security of our nation depends. This is why we practice in peacetime the disciplines we need in war — it gives us confidence that we can execute under stress . . . precisely as planned.

In times of stress — when discipline really counts — I have found that personal integrity is the most important factor. Integrity in the military requires all of the qualities found in other professions — with one major addition. Integrity for those of us who wear the uniform of our country also encompasses the confidence a commander or supervisor has in his people to execute orders or complete an assigned task exactly as given and in accordance with established technical and safety procedures.

The bottom line to this part of readiness is one person depending upon another to do a job correctly — no dangerous shortcuts . . . no slipshod work . . . but a professional job done by the book. If any member of a combat crew or maintenance team does not perform as expected, each and every time, the results can range from someone being required to reaccomplish a task — which costs time and money — to a disaster or tragedy of overwhelming proportions — which degrades our credibility, damages irreplaceable elements of our deterrent force . . . and costs lives.

With this in mind, do not forget that you — the flying and missile crew members and maintenance teams — are the current experts on combat operations. The staff works hard to develop plans, tactics and procedures to meet SAC's operational needs, but they must rely on their previous experience in the field. Staffs at every level need feedback from you on what works best and, more important, what does not work. If you have an idea to help do the job better or to improve our procedures, it is your obligation to speak up.

During the next several years, it is possible this nation will be tested. The outcome of that confrontation will be determined, to a great extent, not by the quality and quantity of our strategic force structure, but by the readiness of the men and women who must face the enemy.

Make sure you are ready to meet this challenge. The future of our country depends on it.

Combat Crew

Magazine of the Strategic Air Command - 31st Year of Publication

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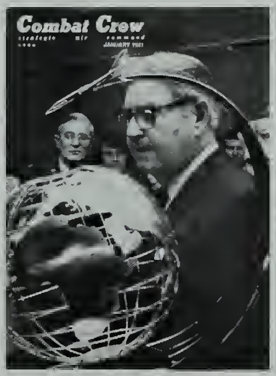

ON OUR COVER

General LeMay viewing the bombing trophy named in his honor.

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Magazine of the Strategic Air Command - 31st Year of Publication

GIANT VOICE

320th Bomb Wing Wins

competition '80

Mather's 320th Bomb Wing took top honors at the 1980 Giant Voice competition when they garnered 88.5% of the total possible points at the SAC bombing and navigation meet. Thus they made off with the coveted Fairchild Trophy and headed back to California, the first B-52 unit in eight years to win the bombing and navigation competition. The 320th people also carried home the General Russell E. Dougherty Short Range Attack Missile (SRAM) Trophy.

Runners-up for the Fairchild trophy were the 319th Bomb Wing, Grand Forks and the 7th Bomb Wing, Carswell. Runners-up for the SRAM trophy included the 28th Bomb Wing, Ellsworth and 319th of Grand Forks.

The Saunders trophy was awarded to the 384th AREFW, McConnell AFB. The 384th attained the most points in all phases of tanker operation. Coming in second and third for the Saunders were the 509th Bomb Wing, Pease AFB and the 307th Air Refueling Group, Travis AFB.

MATHIS TROPHY

The Mathis Trophy, for the best bomber unit based on total points compiled in bombing, was presented to the 319th Bomb Wing, Grand Forks. First and second runners-up for the trophy were the 7th BMW, Carswell, and Mather's 320th BMW.

DOOLITTLE TROPHY

Competition for the Lt Gen James H. Doolittle Trophy was extemely close with the "Mighty Eighth" Air Force edging 15th Air Force. The Eighth collected 82.01 percent of possible points, just .52 percent ahead of the 15th Air Force.

MEYER MEMORIAL TROPHY

The John C. Meyer Memorial Trophy for best F/FB-111 unit in low level bombing was won by the 509th BMW, Pease. First runner-up for the award was the 27th Tactical Fighter Wing, Cannon AFB. Second runner-up was the 380th BMW from Plattsburgh AFB.

CRUMM TROPHY

The 7th BMW from Carswell AFB won the William J. Crumm Linebacker Memorial Trophy. The Royal Air Force's RAF-B claimed second place, followed by the 96th BMW, Dyess AFB. The Crumm Trophy is awarded to the B-52 or RAF unit that compiles the most points in high altitude bombing.

BARTSCH ECM TROPHY

The Maj James M. Bartsch Electronic Warfare Trophy was won by the 42d BMW, Loring AFB. First runner-up for the ECM trophy was the 320th from Mather and second runner-up was the 97th BMW, Blytheville AFB. The ECM trophy is presented to the B-52 unit that achieves the best overall electronic warfare results in the competition.

LEMAY BOMBING TROPHY

The Bombing Trophy, renamed this year in honor of General Curtis E. LeMay, was won by the 380th BMW from Plattsburgh. The LeMay Trophy was awarded to the bomber crew compiling the most points in high and low level bombing. Second place was the 379th BMW, Wurtsmith AFB. In third place was the 5th BMW from Minot AFB.

NAVIGATION TROPHY

The Navigation Trophy was awarded to the 305th Air Refueling Wing, Grissom AFB, with second place going to the 340th AREFG, Altus AFB. Third went to the 92d BMW, Fairchild AFB. The Navigation Trophy is awarded to the tanker unit compiling the most points by their crews in celestial navigation.

BEST CREW AWARDS

The Best Crew awards were won by the following crews and units:

Best B-52. First: Crew S-016, commanded by Capt Myhre E. Paulson, 320th BMW from Mather. Second: Crew S-020, 379th BMW, Wurtsmith AFB. Third: Crew S-002, 320th BMW, also from Mather.

Best FB-111. First: Crew S-58, commanded by Capt Robert C. Hinson, 380th BMW from Plattsburgh. Second: Crew S-07, 509th BMW from Pease AFB. Third: Crew E-31 also from Pease's 509th BMW.

Best Vulcan (RAF). First: Crew RAF-4, commanded by Flt. Lt. Peter Branthwaite. Second: Crew RAF-2. Third: Crew RAF-1.

Best F-111 (TAC). First: Crew S-24, commanded by Capt Michael Damitz, 27th TFW, Cannon AFB. Second: Crew S-31, 27th TFW, Cannon AFB.

Best F-111C (RAAF). First: Crew 10K, commanded by Flt. Lt. Richard Oferral. Second: Crew RAAF-2.

Best KC-135. First: Crew E-108, commanded by Maj James Newton, 384th AREFW, McConnell AFB. Second: Crew E-154, also from the 384th AREFW. Third: Crew E-110, 319th BMW, Grand Forks.

Best Canadian Interceptor (Canadian Forces). First: Lt Col Rinehart H. Koehn, 425th Squadron, Bagotville, Quebec.

Best USAF Interceptor. First: Capt Harold P. Reitzeig from the 318th Fighter Interceptor Squadron, McChord AFB.

The Royal Australian Air Force participated for the first time in SAC's Giant Voice '80. Representing the RAAF was the oldest squadron in the Australian Air Force, Number One Squadron. Its history dates back to 1914. The unit is based at RAAF Base Ambereley near Saint Brisbane, Queensland. Throughout the competition, the RAAF unit staged from and was hosted by the 366th Tactical Fighter Wing at Mountain Home AFB, Idaho. While in the United States on their eight-week visit, the squadron also took advantage of and participated in Tactical Air Command's air superiority exercise named Red Flag.

Other non SAC units in the meet included the Tactical Air Command, Air National Guard, Air Force Reserve, Royal Air Force Strike Command, and the Canadian Royal Air Force.

The competition was designed to test the proficiency and readiness of participating forces and to improve operating procedures and techniques. It also measured the professional capabilities which the competitors have attained through study and training. No actual bombs were carried by competing aircraft, but the competition tested crew proficiency in precision navigation and high and low level altitude bombing. All bombing was electronically scored by ground base radar.

SAUNDERS
McCONNELL
MEYER
PEASE
CRUMM
BASE
UNIT

MATHIS
GRAND FORKS
DOUGHERTY
MATHER
SAUNDERS
McCONNELL
MEYER
PEASE
CRUMM
BARTSCH
GRAND FORKS
319 BMW

GIANT VOICE

GREEN PASTURES

or

Before You Swallow the Cudd, try a Taste First

Lt Col Charles H. Hadley
96th BMW, Dyess AFB

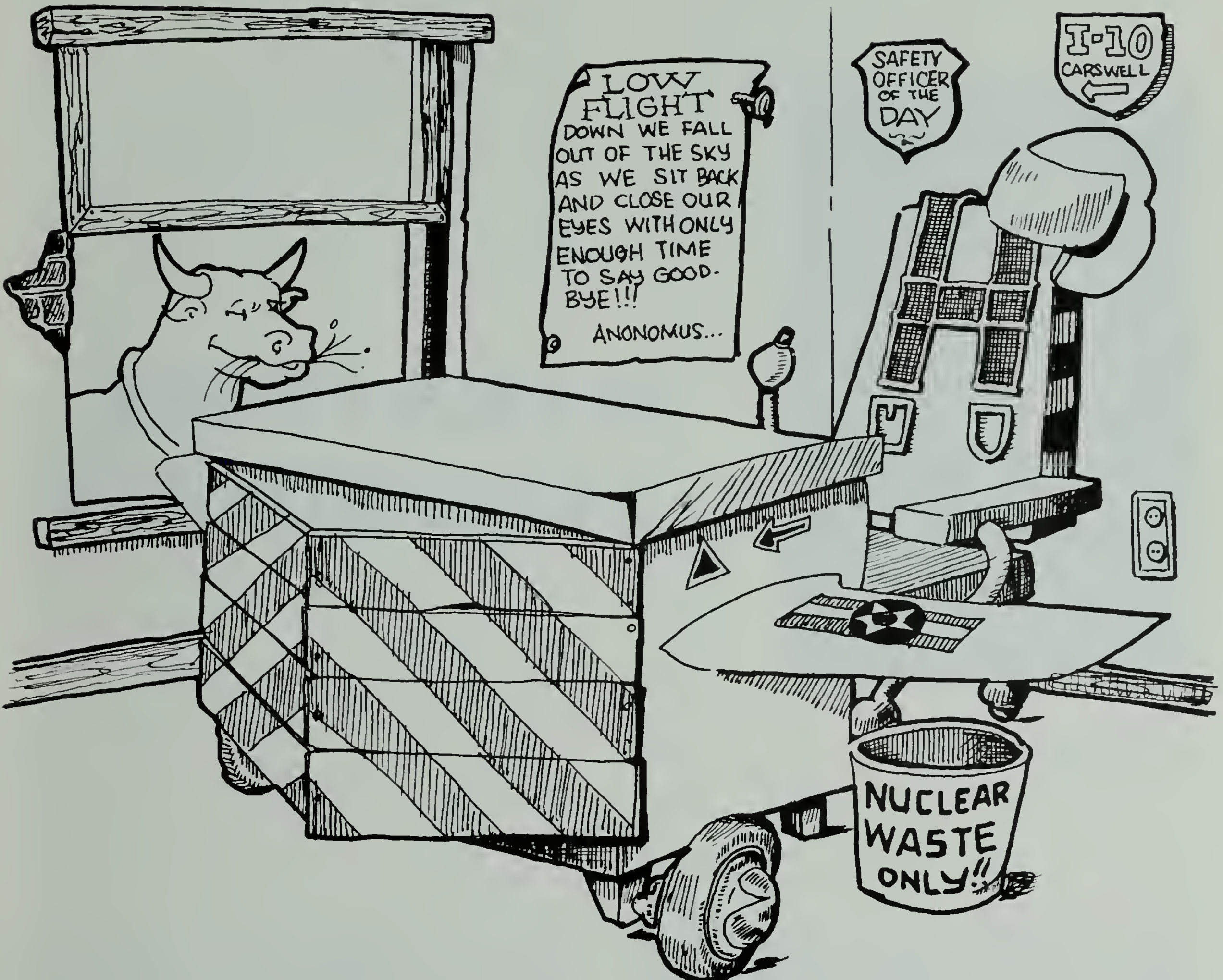
After many years of flying machine operation, being in the clouds and relying totally on instruments has ceased to be discomforting. However, it is still a nice feeling to break out of the clouds, see where you're going and travel VFR. Earlier this year, my wing commander made me trade my flying machine for the chief of safety's desk. Much to my consternation, it was located dead center in a cumulus accumulation of nuclear safety officer mysteries reaching to an eight-foot ceiling. There I was in IFR conditions, but with no instruments.

Fortunately, my predecessor, who could almost fly the desk by the seat of his pants, was riding with me. He guided me out of that first cloud mass into a scattered pattern which allowed me a few glimpses of the route ahead. After about two weeks of shooting touch and go's, I was off to Carswell for the quick *chief of safety nuclear cloud penetration course.*

Returning to my desk, I was all prepared to settle down to the task of being the chief of safety. Surrounded by experts in the flying and ground disciplines, I had been assured that there were OPR's in all of the areas of the nuclear program. Maintenance had the weapons, security police had the protection of the resources, and personnel had the personnel reliability program. Nobody mentioned Catch 22½.

Suddenly, someone mentioned it: Nuclear Surety. Now there is a term to strike terror into the hearts of every new or potential chief of safety. In spite of the competence, integrity, and drive of all the OPR's; someone has to coordinate their activities into one program: Nuclear Surety. To me this has become the challenge of the chief of safety. By now, after five months on the job, I have formed a few opinions which may be of benefit to future chiefs.

First, the chief of safety cannot fly a desk. He must get out of the office and visit the areas of activity. His approach should reflect a belief in the ability and willingness of the personnel, and create a reciprocal belief that he is there to help solve problems. Incompetence and bad attitudes will reveal themselves without the development of an inspection atmosphere. Once


LOW FLIGHT
DOWN WE FALL OUT OF THE SKY AS WE SIT BACK AND CLOSE OUR EYES WITH ONLY ENOUGH TIME TO SAY GOOD-BYE!!!
ANONOMUS...
SAFETY OFFICER OF THE DAY
I-10
CARSWELL
NUCLEAR WASTE ONLY!!

everyone realizes that the chief of safety wants to help; he won't have to seek problems — they will be brought to him. Mutual trust is the name of the game.

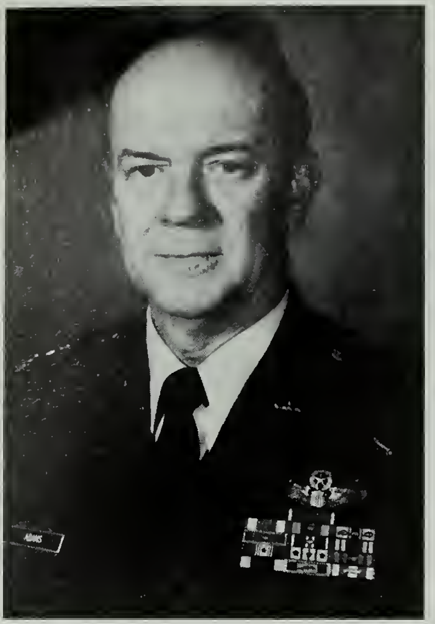
The next major conclusion that I drew was that successful administration of the nuclear program required a team effort. This team is composed of the squadron nuclear officers and noncommisssioned officers. The substance of this team is quality and retainability. How do you assure quality and retainability?

Quality is obtained by convincing the squadron commander that the strength of his program lies in the performance of these individuals. He must be made to realize that this is not just a "management book" task, but that these people make a positive and direct contribution to his program. They are workers. This realization will not only afford you quality, but will also forestall a constant juggling of the lineup. The product will guarantee the retainability of the members of the team.

Besides running their squadron programs, this team forms the nucleus of our nuclear surety self-inspection program. This has created a family atmosphere which transports their individual programs into an identity with the wing program. They know the rules of the game and do not hesitate to call, "foul." We inspect in depth and write hard. This is our house and we work together to keep it clean.

I would also recommend that future chiefs of safety realize that although they may have been selected for their maturity and wisdom, they most likely were not selected because of their nuclear expertise. This honest reflection, during the morning shave, will tend to keep you from telling experts how to do their job. This will also keep you from exposing how little you do know, and will allow you to appear mature and wise. Even more, it will contribute to a learning experience because the experts will be willing to "show and tell."

Finally, I would like to report that much to my surprise, I find that I like my job. There is an idea held by some that chiefs of safety have been put to pasture. If that is true, we weren't put here to graze but to produce.



Maj Gen Christopher S. Adams, Jr.
SAC DCS/Operations Plans

STRATEGIC FLEXIBILITY

At 0400 hours it seemed an eternity before I realized the ringing which had startled me into a dull awareness was not the alarm clock. Setting it back on the bedside table I answered the phone with a poorly disguised attempt to sound fully awake until an urgency in the squadron operations officer's voice betrayed the fact that this was no practice alert.

The bomb wing had been restricted to base for the past 72 hours as the communists seriously threatened a takeover of war torn Europe. A briefing had been set for 0530 to issue the operations orders. This allowed ample time for me to gather my flight gear and think over the uncertainties of the mission which lay ahead.

As a B-36 crew commander, my crew's mission would be to deliver nuclear weapons in an effort to blunt the initial thrust of a Soviet invasion into Europe. We would deploy from Biggs to Kirtland, where Atomic Energy Commission engineers at a nearby weapons storage site would be assembling the few available bombs. From there, deployment to a forward staging base would be necessary for refueling before the final leg which would be an attack against petroleum and transportation facilities in Western Russia. By that time, the war would almost certainly be more than a week old. If successful, the air attack would, hopefully, contain the Red Army encroachment. However, a lengthy conventional air and ground battle was almost certain to follow since the small supply of atomic weapons would rapidly be depleted.

* * * * * * * * *

This reflection of a possible strategic attack which might have happened in the late forties or early fifties is in sharp contrast to the flexibility and responsiveness of today's strategic forces. Let's examine how this is true since, to the SAC combat crew member, the elements of flexibility may be sometimes obscured by checklists, training, standardization, tactical doctrine, and command and control procedures. This seeming contradiction can perhaps best be explained within the framework of national strategic policy and flexible, preplanned attack options matched to the composition and capabilities of today's strategic forces.

As we have seen, strategic forces have not always been so capable of a wide range of employment choices — nor have they always been necessary. Today's flexible employment options have evolved out of necessity with changes in nuclear weapon employment policy resulting from a change in the international balance of power and a rapidly growing threat.

Throughout the fifties and into the sixties, the U. S. enjoyed unquestioned strategic nuclear superiority and relied upon a policy of massive retaliation for its deterrence. By 1964, however, massive counterforce operations were no longer feasible given our second strike strategy and the steady build-up in Soviet nuclear weaponry. Assured destruction, threatening intolerable damage to both sides, emerged as the principle means of discouraging war. During the last decade, there was a shift in thinking as to what actually deters war as policy makers searched for a doctrine which allows a credible response to lesser threats while at the same time holding the promise of escalation control should overall deterrence fail.

Flexible response — the ability to employ strategic weapons in a selective and controlled manner as well as full retaliation — offered an alternative to "all-out nuclear war." Still, any desired strategy cannot ignore the realities of force structures and performance characteristics because they form the foundation upon which capabilities plans are developed.

In the immediate years following World War II, the bomber force, comprised of B-29s, B-50s, and B-36s, was the only means of delivering atomic weapons over intercontinental distances. ICBMs and SLBMs would come later. The bomber force underwent considerable change as the jet engine allowed modern B-47s and B-52s to replace the older bombers. The bomber force grew to an all time high, which peaked in 1958 with nearly 1,800 aircraft, despite the phase out of the B-50s and B-36s. When combined with the worldwide air refueling capability — made possible with the KC-97, delivered to SAC in 1951, and the KC-135 in 1957 — a truly global strike force was achieved, and was well suited for massive retaliation. Responsiveness and protection of this large force was achieved through a rotation between stateside and forward bases in what was commonly referred to as "reflex" operations.

Several other measures helped add flexibility and improve responsiveness. SAC's airborne command post, "Looking Glass," began continuous operations in February 1961. Aircraft ground alert was increased to fifty percent and combat ready crews participated in airborne alert. SAC revived its bomber and tanker dispersal plans to a large number of military and civilian airfields as a counter to the growing threat from Soviet SLBMs. In addition, across-the-board strengthening of conventional forces was necessary to ensure an ability to respond convincingly to conflict at lower levels.

At the same time aircraft numbers were declining with the phase out of B-47s and B-58s. ICBMs and SLBMs were coming on-line in increasing numbers. By 1967, the SAC ICBM force of the Minuteman and Titan IIs had reached 1,054 missiles. The newest ICBM, the Minuteman II, brought flexibility to the SAC force through multiple independently targetable re-entry vehicle (MIRV) payloads and Command Data Buffer (which allows rapid retargeting from ground launch control centers).

These added capabilities increased the targeting flexibility and warfighting utility of SAC forces. Additionally, air launched missiles, such as the Hound Dog and then the SRAM, extended target coverage and allowed heavy bombers to better attack defended targets. SRAM, with its supersonic speed, selectable yields, and multiple flight profiles, was a significant advance in bomber capability which ranked in importance with the jet engine and aerial refueling.

Since Minuteman I phase out in late 1974, SAC force levels have remained essentially unchanged although there are several qualitative efforts that are nearing fruition that will enhance survivability and flexibility. The improved MK12A warhead will provide the Minuteman III with additional flexibility and almost twice the yield of former re-entry vehicles. The M-X system will increase land-based ICBM survivability and improve flexibility, making it much more effective against a wider range of targets.

Deployment of air launched cruise missiles (ALCMs) will allow greater flexibility in bomber planning and penetrativity. These weapon system enhancements, hopefully accompanied by others, will not only increase flexibility but also provide a sound hedge against the uncertainties of conflict at any level.

U. S. strategy will remain one of deterrence. However, what deters an adversary is less clear and is continually being reevaluated. If, in fact, warfighting capability deters, we must be able to attack a wide range of targets. To do that successfully requires a balanced mix of forces, a credible plan, and the resolve to employ them. As we pursue a doctrine of deterrence in the difficult years ahead, we must continue to deal with the military issue of whether we have sufficient means in comparison to the threat and the political issue of whether we are adequately expressing our resolve.

Flexibility in the SAC combat force promises to become increasingly important for the hedge it offers against the uncertainties of modern warfare and its contribution to deterrence. Should deterrence fail, the proper match between well conceived plans and the ability to execute those plans with strong forces and resolve will be imperative if we are to prevail.

The SAC combat crew force is a vital link between policy, plans, and execution on the one hand and flexible responsive weapons systems on the other. General Hap Arnold summed it up another way in 1945 when he said " . . .any Air Force which does not keep its doctrines ahead of its equipment and its visions far into the future, can only delude the nation into a false sense of security." The same is no less true today except it is now time to bring our equipment in line with our doctrines and our planning.

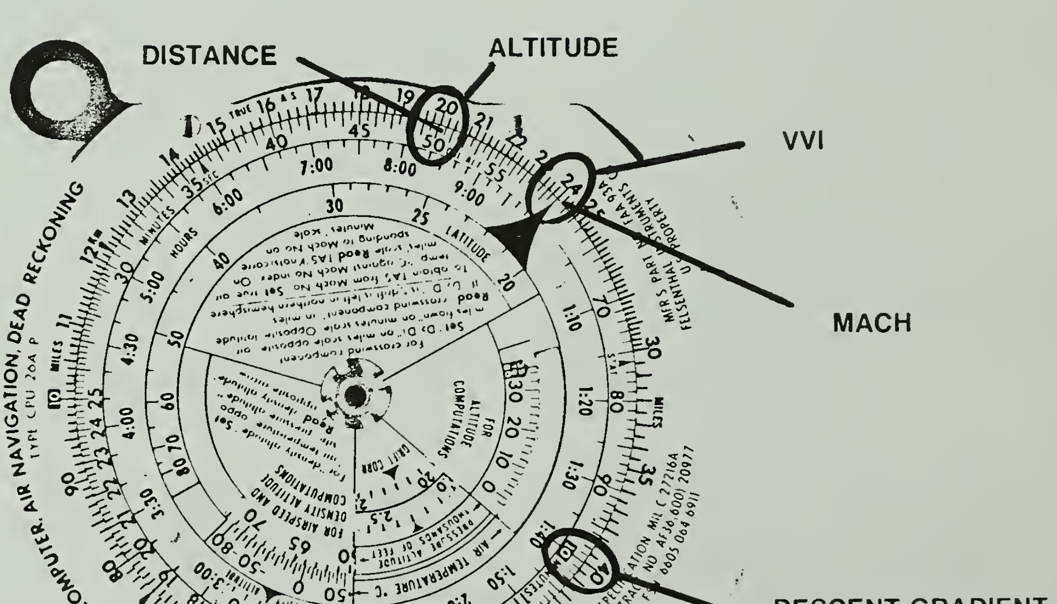
KC-135 Descent Gradient Vs Drag Configuration

Capt Thomas E. Yops
384th AREFG, McConnell AFB

Several past articles have discussed how to compute descent gradients and rates of descent required to make good a specified descent profile. AFM 51-37 briefly discusses the computation which is general in nature and therefore applicable to all aircraft. This article will attempt to relate the computed descent gradient with the corresponding drag configuration for KC-135 aircraft.

How often have you been cleared for an enroute descent only to complete the descent excessively early or fail to make an altitude restriction? A review of standboard trends indicates that such is often the case, and this could be avoided with a little planning on mission planning day. Other reasons for planning the descent are to minimize time at low altitude, and to ensure enough time for establishing the required speed and configuration prior to the FAF. This is important for several reasons. First, it reduces the potential (exposure) for mid-air collisions with small aircraft, and second, it enhances fuel conservation.

Let's briefly review the method to compute the required descent gradient and rate of descent. For example, you are required to lose 20,000 feet in 50 NM and are presently indicating 0.6 Mach. What is the required gradient and descent rate? The solution is simple and looks like this on the flight computer:



Thus, you need an approximate pitch change of 4° from level flight and initially a VVI of 2400 feet per minute. This, of course, will be updated as you descend because you are flying a constant indicated airspeed during the descent and mach will decrease as you descend. A technique that has been utilized for published penetrations is to use an average mach of 0.5 when computing the required descent rate. Crew coordination can be improved by having the navigator compute the above information.

Now how does all of this relate to KC-135 aircraft configuration? Good question, the answer is based on certain assumptions. Descent gradient, VVI, airspeed, altitude, gross weight, thrust, and drag configuration are all interrelated; therefore, the following assumptions have been made:

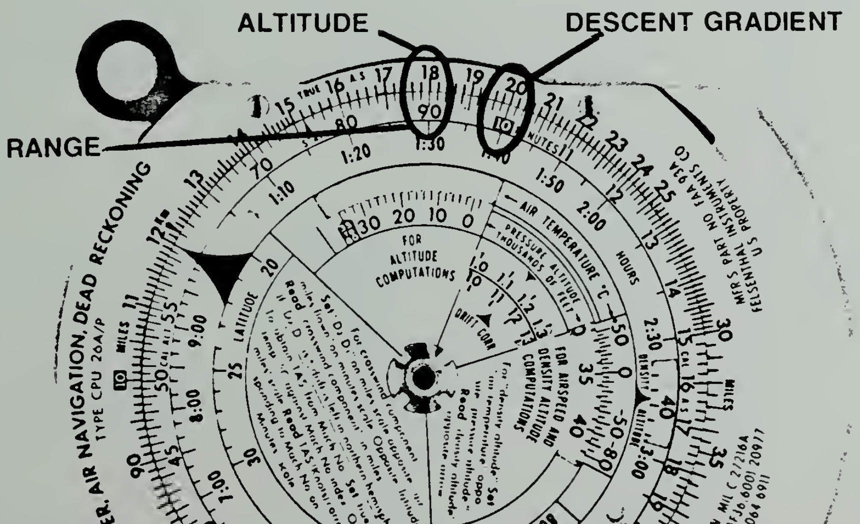
(1) The descent profile is flown at a constant indicated airspeed of 285 Knots below FL 325 and 250 KIAS below 10,000 feet.

(2) Aircraft gross weight is in the neighborhood of 130,000 lbs which is usually the case for KC-135 aircraft in light of the reduced flying hours and fuel conservation.

The following chart then, summarizes the KC-135 aircraft configuration with the corresponding gradients. Remember, these are approximates but are useful for planning descent.

DESCENT GRADIENT		AIRCRAFT CONFIGURATION
285 KIAS Descending To 10,000 Ft	250 KIAS Below 10,000 Ft	
2.0	3.0	Clean, thrust as required for pressurization
6.0	7.0	Gear down, thrust as required for pressurization

To summarize then, let's consider the following example. You are flying at FL 300 and would like to descend to 12,000 ft by 25 DME in a clean configuration. If you are proceeding direct to the tacan, at what point do you start your descent?


ALTITUDE
DESCENT GRADIENT
RANGE
COMPUTER, AIR NAVIGATION, DEAD RECKONING
TYPE CPU 26A/P
FOR ALTITUDE COMPUTATIONS
AIR TEMPERATURE °C
PRESSURE ALTITUDE THOUSANDS OF FEET
FOR AIRSPEED AND DENSITY ALTITUDE COMPUTATIONS

90
+25
115

Thus, you start descent in a clean configuration at 115 DME.

be Safe - not sorry

1Lt D. T. Wells
India Flight Commander
12 SMS
Malmstrom AFB

Among young adults and children, accidents are the leading cause of death. This year, there will be more than 100,000 fatalities in the United States from accidents.

The facts are grim — and they don't just apply to the "other guy." Most of the 100,000+ people who will die accidentally this year don't think they participate in any activities dangerous enough to worry about. And that will lead many down the path to the stark reality of an accident or death.

Not long ago, a young man from my neighborhood died accidentally. It came as a shock to those of us who knew him. He was the one who always set others straight when boating or hunting — he only forgot once! There was a noise under his car that needed to be checked out, so he jacked it up and crawled under for "just a second." The jack gave way — he was crushed. Sitting two feet in front of the car were his jackstands. The paramedics used them, but it was too late. The death was hard to take because it was unnecessary; he was a statistic.

One of the first nice days of spring, three young people decided to go sailing. They checked the weather forecast, the boat, and had life preservers — all the things they were supposed to do. Sailing along in an open bay, the mast hit a high voltage power line. The tragedy was a combination of unusual events; high water, a tall aluminum mast, and a low electric line. Two fatalities resulted from what began as a great afternoon of fun and sun.

How could these accidents have been avoided? Obviously, the first young man was just in too much of a hurry. The five or six extra minutes it would have taken to set up the jackstands could have saved his life. His excuse is the same one people use for not buckling their seat belts on short trips, the same one most people use when they use an electric drill without wearing goggles, the same one you and I use a hundred times, or a thousand times and always get by. Start thinking now about how many saved minutes equals one eye and you'll be one giant step closer to safety awareness.

Our friends in the sailboat had a different problem. They were prepared for all the usual safety hazards, but they were not looking for the unexpected. Pilots are taught early, and often repeat aloud all the potential hazards in their immediate vicinity before their plane taxies on the ground and whenever there is something in the area that could be hazardous. Good drivers are anticipators, too. A constant vigilance to the uniqueness in your surroundings can prevent many accidents from occurring.

Of the more than 100,000 fatalities that will occur from accidents in the United States this year, most are preventable. Good swimmers will drown, good drivers will run off the road, people who know they should not smoke in bed will smoke anyway. Sometimes they will die trying to save a few minutes — sometimes they won't realize a hazard exists until it's too late.

You can start being more safety-conscious now. Take a look at your environment and make a mental note of the potential hazards. Think about how simply and quickly many of those hazards can be eliminated or made obvious to everyone. Enlist others who share your environment to help — they may spot things you didn't. Once the hazards are identified, the work begins. Play it safe and think of the possible costs of hurrying. Show others by example that you practice safety because you care about yourself not because someone might be watching. You too can develop a contagious attitude of safety awareness. ***Be safe not sorry.***

Our job's important.
We're staying in!
U.S AIR FORCE
Rick 80
WE WANT YOU TO STAY WITH US AF

Capt Chris P. Moore
B-52 Aircrew Training, Barksdale AFB

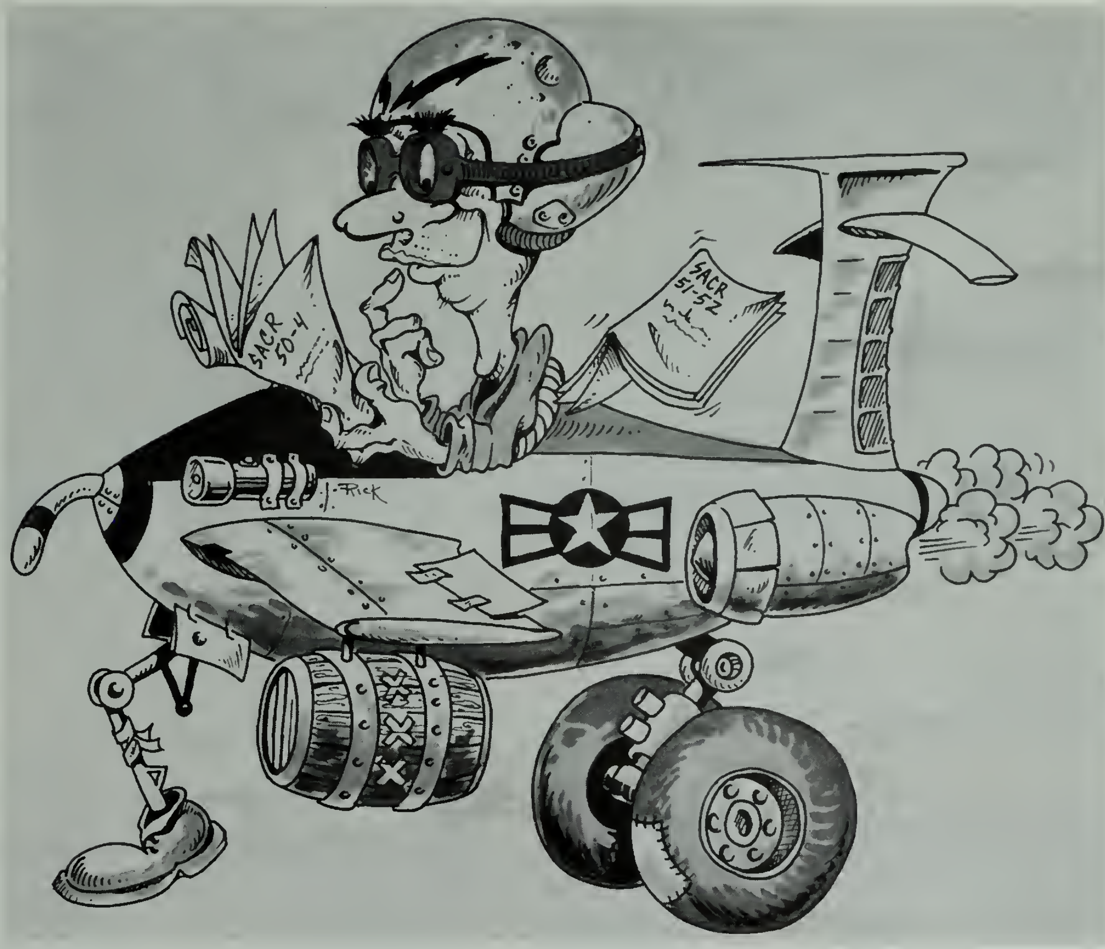
INSTRUMENT FLYING TECHNIQUES

This is the last in a series of TA/EVS articles by Capt Moore.

This discussion presupposes a thorough knowledge of AFM 51-37 Attitude Instrument Flying. It focuses on use of EVS displays. Non-EVS equipped aircraft must use the ADI for attitude reference. EVS display accuracy should be verified during the bombing system check and VECTOR stabilization selected. **PITCH:** Attain unaccelerated flight. Center the PITCH and ROLL INDICATOR under the FIDUCIAL MARKS. The pitch and roll indicator is about 1° in thickness and is graduated laterally in 5° increments. The fiducial marks are about ½° in thickness. Using the fiducial marks and the pitch and roll indicator, precise pitch control is easily developed. Cross-check the altimeter, vertical velocity indicator, radar altimeter, and EVS RADAR ALTITUDE INDICATOR to stabilize in level flight. Now add the TA display. While continuing unaccelerated flight, note the position of the TA TERRAIN TRACE relative to the TA HORIZONTAL REFERENCE LINE. Use smooth control stick inputs to make a 2° pitch change on the EVS and hold for about 15 seconds. This should allow a 200 foot altitude change. Level off, and reevaluate the HRL-TA trace relationship. Each new adjustment should be smaller, until the HRL and TA trace are coincident.

POWER: Power adjustments should be precise rather than random and based on requirements rather than speculation. Set a total fuel flow (derived from the range charts during mission planning) that corresponds to your desired indicated airspeed at the average flight level for the route. An adjustment of 1000 PPH will adjust your airspeed by 10 knots if you are not on speed with the first setting. An adjustment of 5-10000 PPH will accommodate a 1000 FPM climb or descent, and should be used when making significant altitude changes, but not for the constant ups and downs of flat and rolling TA flight, where climbs and descents will average out the airspeed. If mission planning route study has determined a need for NRT or MRT, have the pilot not flying the airplane set an inboard throttle to target EPR, and then the flying pilot can match that throttle. Use idle power and airbrakes during the TA tactic only when route study has shown the need for a drastic descent. Level off at target altitude, then step down to clearance altitude using the terrain trace and radar altimeter.

ALTITUDE: While treating altitude control as a subject divorced from pitch and power seems inconsistent, the special requirements of TA flight warrant separate discussion. The first rule in altitude control while flying terrain avoidance is to FLY THE TERRAIN TRACE. Your corrections and equipment adjustments will be haphazard and your training of little value if you do not make a disciplined effort to fly the terrain trace before making any adjustment. Once you have the HRL coincident with the trace, and are controlling pitch and power effectively to stay on the trace, evaluate your terrain clearance as shown on the radar altimeter and EVS radar altitude indicator. Switch range gates, and evaluate the tilt characteristics of the set. If you are flying off altitude due to a bias error, or you determine positive tilt error that can be overcome using a different clearance plane setting, then make a predetermined adjustment to the clearance plane. A much used technique is to adjust the clearance plane by the total difference if you are flying too low, and one-half the difference if you are flying too high.



Again, fly the terrain trace and evaluate this new clearance plane setting. Readjust as necessary. Pass the final clearance plane setting used to the navigator, and make separate AFTO Form 781 entries for tilt and bias errors you detect.

CROSSOVER: Crossover techniques are another area where good instrument flight can make a big difference in successful altitude control while flying TA. As an obstacle is approached and the terrain trace starts rising, smoothly increase the aircraft pitch until the trace and HRL stabilize together. When the proper pitch attitude is achieved, hold it on the ADI or with reference to the horizontal fiducial marks and pitch and roll reference bar. After trace dropout occurs, note the second hand on the instrument panel clock and hold the attitude for 10 seconds (at 270 KIAS) or for 16 one-way sweeps of the terrain trace, then observe crossover on the radar altimeter. (The timing method is easiest, but brings the clock into your crosscheck.) Lower the nose to level flight, watch the terrain trace for three sweeps, during which time it should stabilize, then start back down.

The vertical fiducial marks can help in determining crossover pitch attitude. At three miles range, switch to NFOV and make a smooth pitch up placing the bottom of the vertical fiducial mark on top of the terrain feature. Note and hold this pitch attitude. This gives an 800' crossover. Adjusting your pitch attitude above or below this to get the specified clearance is a matter of judgment. With some practice, this technique will produce excellent crossovers. (See Combat Crew article, *Let's Talk TA/EVS,* May and July 80, Maj. J. Doug Ellinger.)

HEADING: Crew coordination on the use of navaids, the HSI heading marker and BNS HDG switch has already been discussed. As with any instrument maneuver, TA heading control depends on basic instrument techniques. Make smooth roll-ins with spoiler and rudder, compensating for the pitch up induced by spoiler with elevator. Use the ADI bank index or the pitch and roll indicator to hold exact bank angles for turns at turn points and when correcting to course. EVS pilots should take full advantage of their opportunities to view the world ahead of them and accommodate obstacles during turns by climbing, if required.

These articles have passed on some tested and proven techniques for flying the TA tactic. Your application of the techniques covered in these last five issues of *Combat Crew* will improve your low level abilities and contribute to SAC's credibility as a deterrent force.

The following article, detailing some methods that B-52 navigators can apply in order to conserve fuel, was developed by 1Lt Mark A. Peterson, navigator, with the assistance of 1Lt Peter B. Mapes, a copilot on the B-52G. They have applied these ideas over numerous flights and believe they demonstrate their success.

Planning to Conserve

1Lt Mark A. Peterson
1Lt Peter B. Mapes
524th Bomb Sq, Wurtsmith AFB

The United States has entered a period of petroleum shortages that stretch across our entire economy. The military is being asked to accomplish the same training with a decreased amount of fuel. Not only has the availability of fuel become less, the price of Military Jet Fuel has risen over 100% in the last year. Any fuel savings resulting from a little extra mission planning could therefore amount to a significant monetary savings if used command wide.

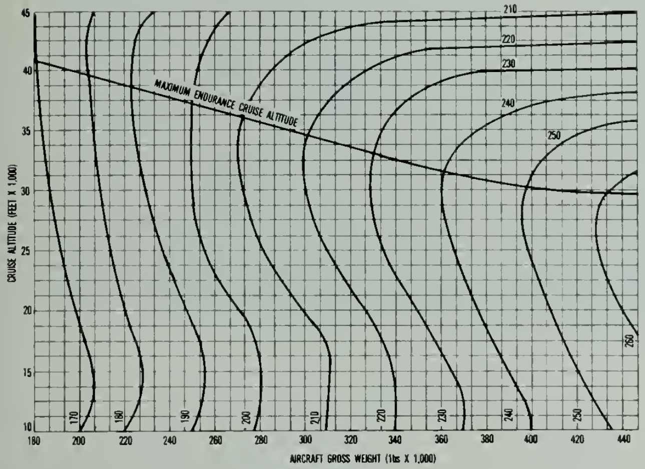
The purpose of this article is to provide B-52 Navigators a simple method to use in mission planning for a more fuel efficient mission. Because of mission requirements, location of bases and military training areas, Navigators must plan from point A to point B in a given amount of time. Most B-52 Navigators are trained and become accustomed to planning with a true air speed of 444 (mach .77) at flight levels from 31 to 35 even though there is no requirement to do so. Using whatever winds, they establish a groundspeed to determine a distance and therefore a flight path to fit the time between activities. By planning to fly at best range or best endurance airspeed and altitude, the fuel flow can be reduced and a significant fuel savings is achieved. Best range airspeed provides the lowest fuel use per mile and is the most economical method to fly between points in a given amount of time. Best endurance airspeed offers the lowest fuel use per given period of time such as a fireout or a fighter intercept exercise and is ideal when flying Nav legs or when required to remain in an area for a period of time. The problem in planning to fly at best range or best endurance is that the gross weight of the aircraft is needed to enter the graphs. Normally, the Navigator plans the mission and then the Co-pilot figures the fuel to fit the plan. With the following figures, a Navigator can quickly estimate the aircrafts gross weight and then enter the graphs to determine the best speed and altitude to fly. The figures are sufficient to give estimates of fuel changes in a B-52G and where necessary, interpolations should be made between the values.

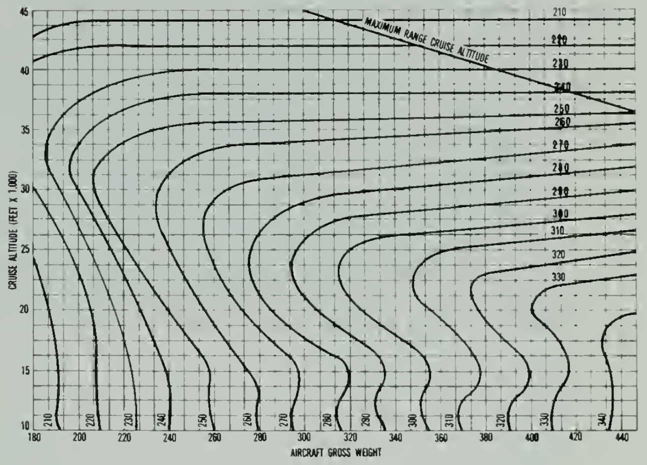
SETTOAC Fuel Use — 8500 lbs of fuel
Rates of Climb Fuel use — NRT — 725 lbs/min; MRT — 825 lbs/min

Note — Rates of climb change depending upon gross weights. The following rates of climb are more accurate than the standard 1500 ft/min used in planning and will give a more accurate time to level off for computing weights and fuels.

GROSS WEIGHT	NRT RATE	MRT RATE
450,000 lbs	1600 ft/min	2300 ft/min
350,000 lbs	2400 ft/min	3300 ft/min
250,000 lbs	3700 ft/min	4900 ft/min

Climbing using MRT allows the aircraft to reach cruise altitude much faster at a slightly higher fueluse per minute and therefore provides an increased fuel savings by significantly reducing the time to climb. MRT however produces more wear on the engines and until the price of fuel increases to the point where it is cheaper to replace an engine, NRT should be used unless an EWO departure is scheduled





or you have a late take-off and need to make up some time.

At max range or endurance altitudes, the fuel flow approximately equals the gross weight of the aircraft:

GROSS WEIGHT	FUEL USE
400,000 lbs	400 lbs/min
300,000 lbs	300 lbs/min
250,000 lbs	250 lbs/min

Air refueling is a relatively fuel intensive activity since the aircraft is flying in the tankers wake and the pilots are constantly changing the throttle settings. The fuel flow for air refueling is estimated at: 450 lbs/min.

The average fuel flow for low level flights whether IFR or TA is: 500 lbs/min.

To find the max range or endurance altitude and airspeed, use the 60-9 to get the fuel load. Add the fuel load to the basic weight of the aircraft and add 270 lbs for each passenger. Subtract the values for SET-TOAC and climb fuel to arrive at a level off gross weight. Enter the graph with the gross weight, go up to the max range or endurance cruise altitude line and interpolate between the lines to determine the airspeed. The FAA still requires us to file for a hemispheric altitude but once airborne, ask Center for the desired altitude and inform them it is for fuel conservation. When it is not convenient to climb up to the max altitude, climb to the desired altitude and use the airspeed for that altitude off the graph. The airspeeds given in the graph are calibrated airspeeds and therefore should be converted to true airspeeds or indicated mach numbers. (In a pinch, calibrated airspeeds almost equal indicated airspeeds in a B-52). Use the fuel flows given to determine the change in weight for each activity. Every time you plan to cruise, re-enter the graph with the new gross weight to determine the new altitude and airspeed.

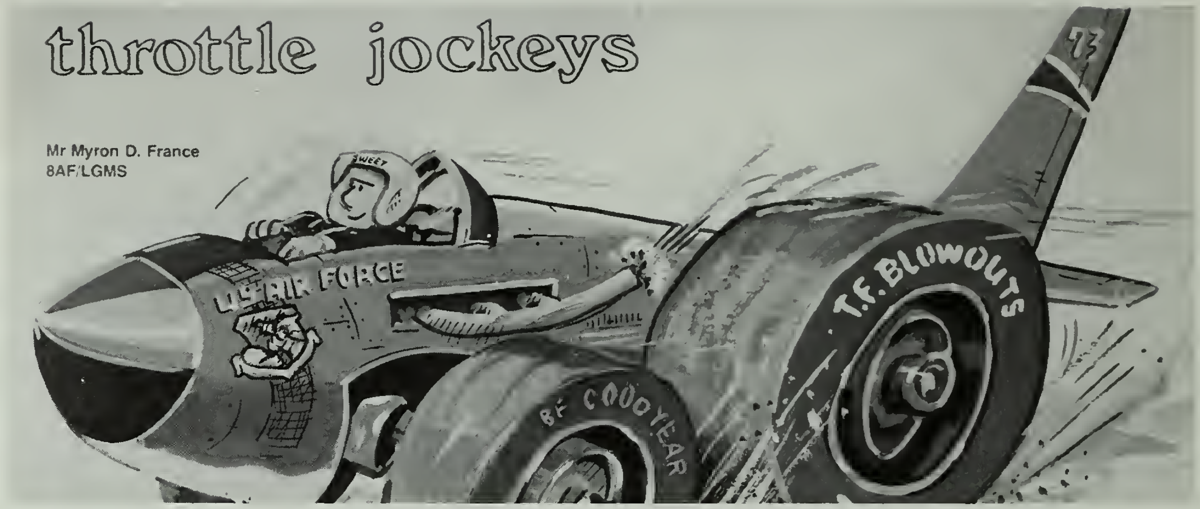
In addition to planning to save fuel, some other methods which can increase overall fuel savings are listed below:

1. Taking off later if you do not need all the time to get to the first activity.
2. File for a published SID but request radar vectors prior to takeoff. If approved, delay takeoff by amount of time saved. (Check with Center first because of high traffic density in some areas).
3. Plan smaller timing loops or triangles. Flying at best range or endurance should provide sufficient speedup if it is needed.
4. Less pattern time unless the pilots really need more practice. Accomplish only the required approaches, don't get "just one more."
5. When possible, ask for simulated minimum fuel traffic patterns.
6. Bring the gear up as soon as possible after a touch and go or a low approach.

Planning to fly higher and slower has been tried by a lot of crews, but unless you went into a performance book to find out just how high or how slow, more fuel was wasted climbing too high or by flying too slow. Using the little extra planning described for every mission could achieve a five to twelve percent savings in fuel as compared to flying "The Old Way". For the 524TH Bomb Squadron alone, this could amount to a savings of $550,000 to $3,200,000 per year. If applied Command wide on all aircraft, the money saved could provide some relief for our tightened defense budget and help us to conserve our fuel by planning to do so.

throttle jockeys

Mr Myron D. France
8AF/LGMS



How would you like to get 50 more miles per gallon on your family car? Boy, that's a dumb question, isn't it? Well, we may not get that kind of an increase, but did you know that our B-52 and KC-135 flight crews are wasting enough fuel each flight to run the family car all year? Have I got your interest yet? Let me tell you why I say this.

The engines on our B-52 and KC-135 aircraft are flat rated, or part throttle engines. This means that they are capable of producing rated thrust at less than full throttle at any temperature below 100°F. Another thing is that every J-57/TF-33 engine performs differently after manufacture or overhaul. When the engines are accepted on the test cell, the data plate is marked for the RPM at which they develop military rated thrust. This may vary from 93 to 94% RPM. What this really means is that some engines are much more efficient than others. Take two engines on the high and low of this efficiency range: one engine may burn 1000 pounds of fuel per hour more than the other and yet produce exactly the same amount of thrust. Because of this wide range of fuel flow, we had to have some means of setting up our engines with symmetric thrust. The EPR system does just this, and when properly maintained, does it quite well.

I would now like to set up two extreme examples. One engine, freshly out of overhaul with good, clean efficient compressors, will produce its thrust at 93.5% RPM with a fuel flow of 8000 pounds at sea level. The engine next to it on the wing has 3500 hours since overhaul, less efficient compressors due to accumulation of dirt and erosion, and produce the exact same thrust at 97% RPM with 8890 pounds fuel flow at sea level.

If we ignore EPR and set up our power by fuel flow, we are in effect wasting the extra fuel burned by the more efficient engine. We also have to trim the aircraft controls to accommodate the asymmetric thrust. This drag wastes fuel. There is one other side effect that takes more money out of our pockets. That same efficient engine, set at the same fuel flow as the older one, is running at a higher RPM and EGT than required, thereby shortening its life. We are really losing both ways, fuel and engine life.

Air Force Logistics Command is working on a plan to upgrade our J-57 engines. They plan to spend 2.5 billion dollars for new parts to bring the engines back to like-new performance. They have projected that these improvements will lead to overall savings of 3.6 billion dollars of which 1.4 billion dollars will be fuel savings resulting from increased efficiency of new parts. The fact remains that this projected fuel savings is based on using EPR for power setting. If we continue to use fuel flow for power setting, the savings will go right out the tail pipe.

Some of you are saying by now, *"What are you talking about?"* The Dash One in both aircraft indicates EPR is the only instrument to be used for power settings. I fly by the book!

We make many staff visits in KC-135 aircraft and always make it a point to observe the engine instruments during a trip to the cockpit. In over 95% of our observations, the fuel flow gauges are the only instruments lined up — EPR will vary widely. Candid conversations with many B-52 crews indicate this is common practice with that aircraft also. I know that old habits are hard to break, but we are talking about saving billions of dollars in fuel and having more reliable, longer lasting engines. You be the judge: Is it worth the extra effort?

BET YOUR LIFE!

A1C Robert B. Gillespie
Aircrew Tng Instructor
Aircrew Life Support
Castle AFB

It's 0730; with half open eyes you scan the training schedule only to see: another class at life support! Man, what a drag. I just had that class last year. Maybe I can sign the roster and slip out the back . . .

Sound familiar? Every crewmember in SAC goes through the same thing every year. Survival continuation training (SCT) consists of a number of classes that are on an annual basis: water, arctic, and combat survival; they're all there. And you'll say, "I know that stuff already." Do you now? Anyone care to place a bet? You must like to gamble if that's what you think. You might as well bet your life on it, you do every time you fly.

How well do you know your survival techniques? Well enough to spend a couple of days in the wilderness? What about a couple of weeks? As an SCT instructor I still have to study all of the aspects of each survival situation before the training block begins, and I taught the same class only a year before for two solid months. Compare that with your one-hour class per year. So you say, "I've been to survival school." So have I. How long has it been since you were there? Remember at survival school you were in a controlled environment; when it's the real thing, there are no instructors to bail you out or show you how. You are on your own, and you'll pay for your mistakes. You're playing against stiff odds, and Mother Nature deals the cards.

Want to find out what your odds are? Take the following test, it can give you a rough idea. Before the next class, sit down and write out everything you know about the subject being taught, list everything you will do, in the order of importance. Now go to the class and pay close attention to what is said and compare that with your list. How many areas did you miss? Out of the ones that you missed, how many could cost you your life? Count each as 10%. How many could delay rescue in finding you? Count each of those as 5%. How many could put you into a situation where your will to live might be affected? These are worth 2%. Keep in mind while you're doing this that any big mistakes could end your survival rather abruptly. Now give 10% for any areas that you might forget because of shock. Total the percentages and deduct from 100%.

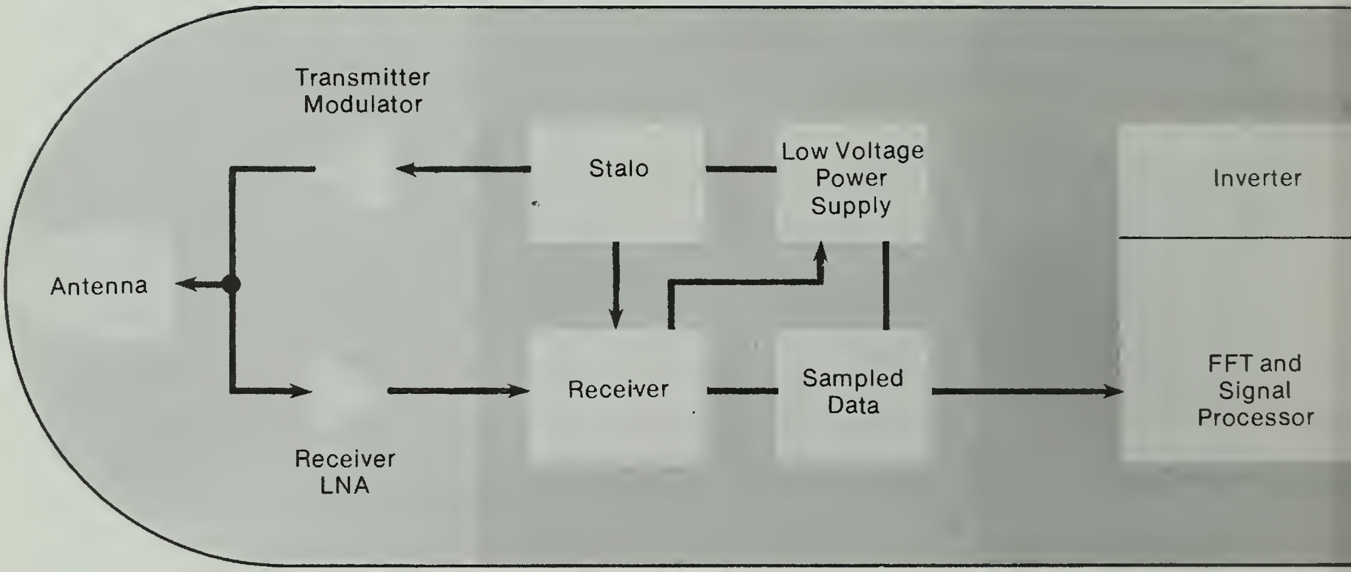
Still don't think you need the class? If not, add these problems to your list: you may be injured; you may not have your survival kit; you never had to board a raft with 30 knot winds and 10 foot waves; it could be dark and you don't have a flashlight. Had enough?

After making your deductions, what percent do you have left? 50%? 25%? The percent left is a rough estimate of the percentage of odds in your favor. Of course, this test is by no means a practical way of determining your survival; we all know that anything can happen. It's only designed to make you think about how much you really know.

Here is something else to ponder. The next time a friend asks you to sign them off, imagine the two of you in the following situation. You are seriously injured and it's up to that person to keep both of you alive until rescue arrives. Will he/she remember and know what to do. Maybe you would like to increase your odds. The next time you attend a life support training class, actively participate. Life support is there to help increase your odds, and you can bet your life on that.

CHECKING SIX

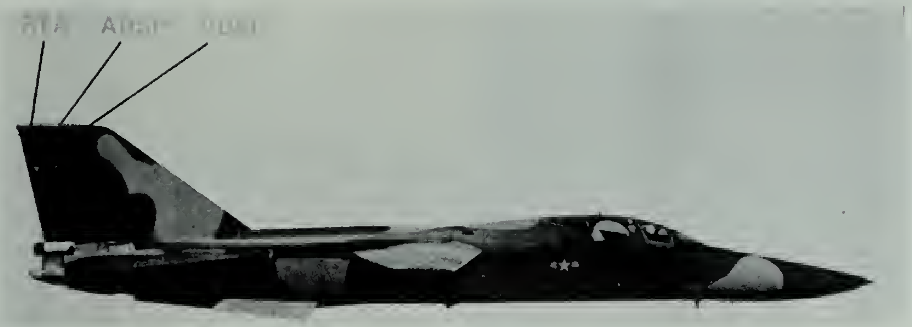
Lt Col Richard M. Williams
HQ SAC/XPHN

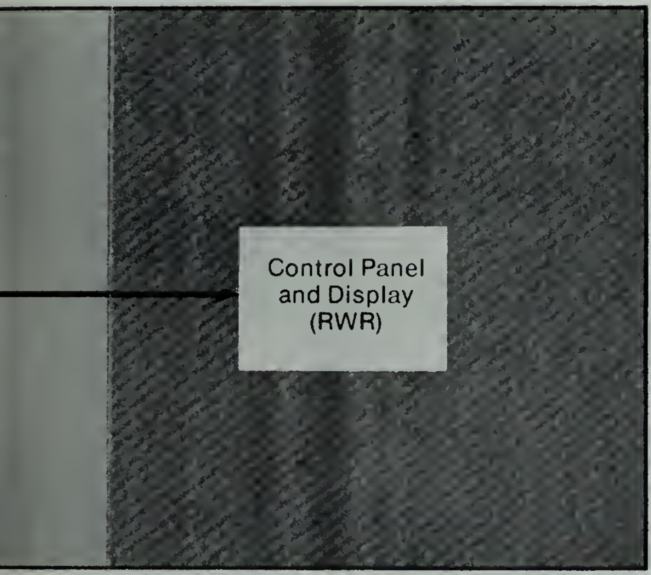


r&d corner

In the heat of combat, you need tail warning. Ever since military man first took to the skies in anger, he knew danger lurked on his tail. In today's air combat arena, fast-closing missiles and enemy aircraft approaching from the rear are a constant danger to SAC's FB-111As.

The AN/ALQ-153 Tail Warning Set (TWS), slated to replace the AAR-34 Infrared Receiving Set, provides the needed protection from these rear-closing threats with accurate, split-second detection, automatically triggered dispensing of countermeasures and timely warning for appropriate evasive maneuvers.





Designed for maximum hardware commonality for both fighter and bomber aircraft, the TWS is currently in production for the B-52 and is projected to go on the F/FB-111s in the 1983-1984 time frame. Some of the features of the FB-111 TWS are:

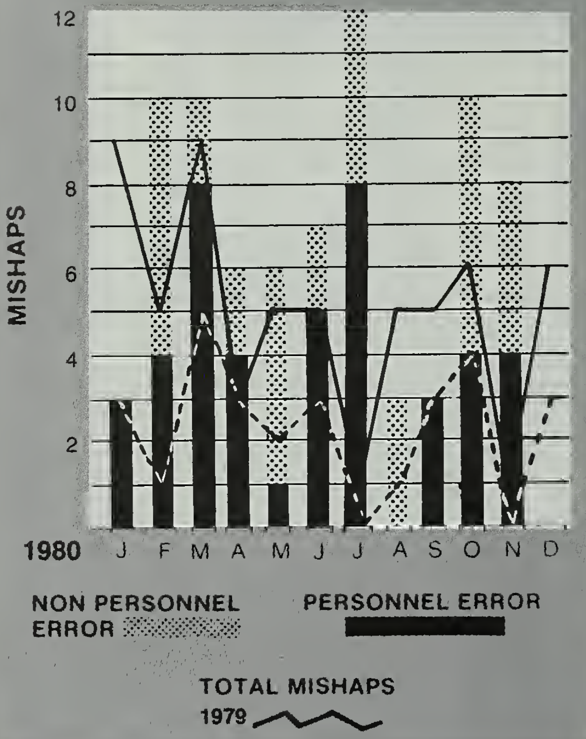
- — Discrimination between aircraft and missiles.
- — Existing RWR displays utilized for information.
- — All-weather performance against aircraft and missile threats independent of the guidance system.
- — Increased tactical flexibility in the combat arena because you know where the enemy is.
- — Reduced crew workload in a dense environment.
- — A low false alarm rate, a high mean time between failure (MTBF) and highly ruggedized construction to assure performance during severe shock and tail fin vibration.
- — Firmware reprogrammability to handle new threats.

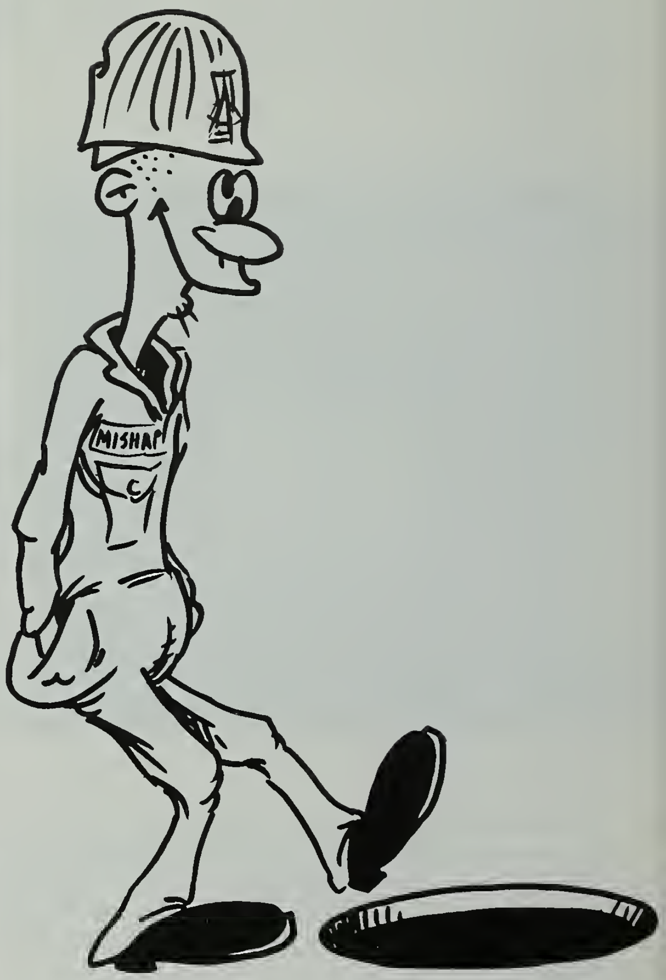
The F/FB-111 system is composed of four line replaceable units (LRUs) — a receiver/transmitter antenna (RTA), an analog data signal processor (ADSP), a digital data signal processor (DDSP) and a cockpit control panel. The RTA contains a nonscanning monopulse antenna which provides wide angular coverage, a power amplifier which provides the frequency/PRF agile transmitter function, a low noise amplifier to provide the receiver function, and — the entire RTA is mounted in the tail fin for unobstructed coverage. The ADSP and DDSP, also mounted in the tail fin, perform all analog-to-digital conversions and processing functions necessary for threat identification and display. The control panel design consists of a single on/off switch and lights displaying only the system status. Threat display information is integrated with and shown on the ALR-62 RWR display scope.

In the final analysis, mission success and crew survival depend heavily on rapid, early detection and warning of rear-closing threats and timely countermeasures and tactics used against them. The AN/ALQ-153 is SAC's answer for mission success.

Missile Mishap Report

DOD CLASS A, B and C





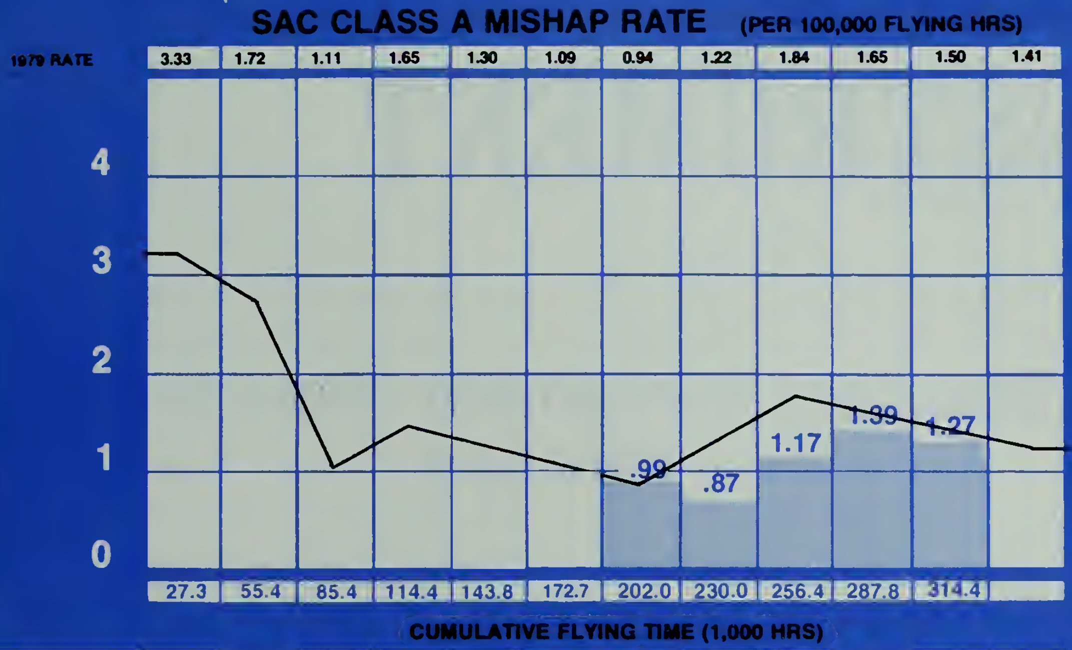
MISHAP WAITING TO HAPPEN

While closing the launcher closure door, difficulty was encountered in resetting the multiplying linkage with the resetting device. An unauthorized procedure involving a 17-pound pry bar was used to try to reset the multiplying linkage. The pry bar was inserted in the open end of the resetting device and one team member was jumping on the bar for leverage. The pry bar slipped, rolled across the open launcher closure door and fell down the launch tube. The pry bar struck an installed work cage, brushed the technician in the work cage, scratched the missile and fell to the launch tube floor. Anybody want to guess what the consequences of this incident could have been?

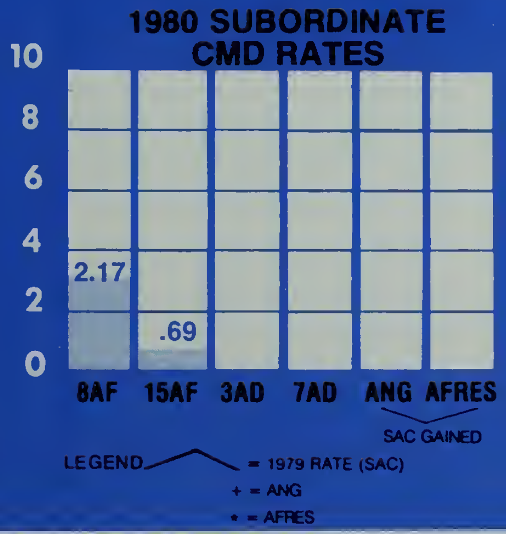
MOTOR GENERATORS X 5

During a three-day period, several LFs experienced 400 Hertz power loss and shutdown. The motor generators failed due to suspected internal damage during the power fluctuations. Preventive action is pending results of final investigation and tear down analysis reports.

1980 Flying Safety Rate



MISHAPS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1979	1	0	0	1	0	0	0	1	2	0	0	0
1980	0	0	0	0	0	0	2	0	1	1	0	



MISHAP STATUS

KC-135A	JULY 80
FB-111A	JULY 80
B-52	SEP 80
FB-111	OCT 80

BIG INSTRUMENT

Standard Instrument Departures, Revised

Captain John C. Conley
1st Combat Evaluation Group
Barksdale Air Force Base, LA

With fuel conservation playing an increasingly important role in today's flying procedures, most of us have turned away from Standard Instrument Departures for the quicker, more fuel efficient Radar Departure. In fact some of us aviators have forgotten all about SIDs. What's that you say? It is just a piece of paper that you forgot to pick up at Base Ops. Have you ever had to shut down and go back into Base Ops to get one?

The point is: if you haven't flown a SID recently it is time to refresh your memory about this expeditious and sometimes challenging phase of flight, and to look at some important new procedural changes concerning SIDs in AFM 51-37.

The purpose of the SID still remains the same: to prescribe a safe route of flight for a climb to the enroute structure, minimize communication and clearance delays, and provide Air Traffic Control (ATC) clearance in the event of radio failure. Also, in high density traffic areas ATC may require use of a SID to provide them a known and expeditious route of departure from your base.

To determine whether or not you must fly a SID, check with the Base Ops people when you file. In any case "expect the unexpected" and carry a SID with you even if you filed for a Radar Departure — it might save a round trip walk to Base Ops. In selecting your SID, choose the current one that meets your flight profile. In other words, is it a high, low, combined, or a civilian SID chart and does it go in your planned general direction.

Remember civilian SIDs may specify higher weather minimums for takeoff than for landing because civilian procedures often use the see-and-avoid principle for obstacle clearance. A change to AFM 51-37 adds:

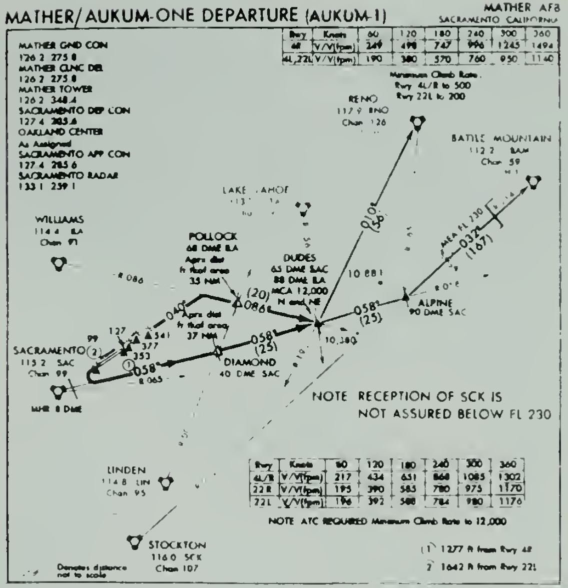
"When a departure procedure or a SID contain both a climb gradient and takeoff minimums, Air Force pilots must insure that their aircraft can meet or exceed the published climb gradient in order to be assured adequate obstacle clearance. In this case, Air Force pilots should disregard the published takeoff minimums and comply with the takeoff minimums outlined in AFR 60-16."

In preparing for a SID you should peruse the SID for climb rate charts, minimum reception altitudes of TACANs/VORs, minimum clearance altitudes (MCA), minimum enroute altitudes (MEA), and any cautionary notes. Also compare the SID with the approach charts for obstructions and minimum safe and emergency safe altitudes because the SID may not depict these items.

If no climb gradient chart is depicted, a recent AFM 51-37 change directs you to maintain at least a 200 foot per nautical mile (approximately 2°) rate of climb. If the gradient exceeds this rate then military SIDs will have a chart to depict the required VVI (feet/minute), while civilian SIDs will only depict the required climb gradient in feet per nautical mile. Remember if you cannot meet the climb gradient you can select another SID, reduce the aircraft gross weight, or request a VFR climb. Be aware that requesting a Radar Departure will not automatically solve the climb gradient problem because no climb criteria is considered on radar departures and controllers do not necessarily know the climb capability of each aircraft.

You may also find a SID with an ATC REQUIRED Minimum Climb Rate chart that must be maintained throughout the SID until reaching a designated fix or an altitude indicated by the SID where normal climb rates can be resumed. (See figure 1) Remember the charted rate is a MINIMUM and not an average climb rate. Therefore it may not be acceptable to takeoff, level-off (to accelerate or retract flaps) and then climb rapidly to make up for the leveloff. For example:

FIGURE 1



For a KC-135 to climb out on the MATHER/AUKUM-ONE DEPARTURE Runway 22L depicted, use his normal climb speeds of 250 KIAS to 10,000 ft MSL and then accelerate to 285 KIAS for the remaining climb will require a rate of at least

817 ft/min at 250 KIAS
849 ft/min at 260 KIAS
882 ft/min at 270 KIAS
931 ft/min at 285 KIAS

If these rates cannot be maintained then a 250 KIAS climb will have to be continued to 12,000 feet MSL before leveling off for the acceleration.

Other recent changes to AFM 51-37 that haven't been mentioned are:

"When executing a departure procedure or a SID, aircrews must climb on runway heading until reaching at least 400 feet above the aerodrome elevation, unless otherwise noted."

"When departing from Civil Airports, aircrews must plan to cross the departure end of the runway at least 35 feet above ground level unless otherwise noted."

This latter change can restrict the use of numerous civil aerodromes that have been previously available because of the relation to aircraft gross weight, takeoff distance data, and obstruction clearance criteria.

In summary we hope this article answered a few of those "thought of but never asked" questions, reviewed some major SID pitfalls, and discussed some of the new and revolutionary changes to AFM 51-37. A SID is developed as a *safe* departure route and your premission preparation determines *how safe* and *how well* you execute it. Remember, a SID chart only does you some good if it is *in your cockpit* and not on the Base Ops desk.

PROFESSIONAL PERFORMERS

SAFETY NCO

TSgt Doyle E. Oelschlegel, 44th Civil Engineering Squadron, Ellsworth AFB, is SAC Safety Man of the Month. He was appointed Unit Safety NCO for the 44th CES from 12 Nov 79 through 24 Sep 80. Due to his untiring efforts, the unit's safety program improved tremendously. Through his safety education and inspection program, safety has become an integral part of each and every CE function. During his tenure, TSgt Oelschlegel developed a slide presentation depicting mishaps, causes, corrective actions, and unit standings for the Quarterly Safety Award. This program was updated each week and presented to all branch chiefs and supervisors at their weekly meeting. This presentation resulted in an intense competition between unit agencies to be free of deficiencies in all safety areas. TSgt Oelschlegel's personal interest and dedication to see a job well done has resulted in his unit's safety program being a model for the other assigned units on Ellsworth Air Force Base.

MINUTEMAN CREW

44th SMW, Crew R-093, Maj Nathaniel L. Powell (MCCC), and 2nd Lt Harold C. Stuart (DMCCC)

TITAN CREW

308 SMW, Crew R-117, 1Lt Michael J. Obal (MCCC), 2Lt James M. Galliher (DMCCC), SSgt Norman C. Crouch (MSAT), and A1C Ronald D. Barber (MFT)

FLYING CREW

Captain Rodriguez and crew E-112, 92nd BMW, observed decreasing right hydraulic system pressure in their KC-135A while flying a refueling sortie in support of Red Flag Operations. The right system was depressurized according to Dash 1 procedures. Within ten minutes, the number 4 hydraulic overheat light illuminated followed shortly by illumination of the number 3 hydraulic overheat light. Both right system hydraulic pumps were isolated according to Dash 1 procedures and the air refueling mission was cancelled. While enroute to their home base, the number 1 hydraulic pump inoperative light illuminated and that pump was isolated. Subsequently, the number 2 hydraulic pump inoperative light illuminated and that pump was also isolated. The crew now had an aircraft with both main hydraulic systems inoperative, 100,000 pounds of fuel on board, and an extreme aft center of gravity condition.

The crew analyzed the situation and decided to re-activate the number 3 hydraulic pump for fuel management of the center of gravity. With this problem alleviated, the crew consulted with a hydraulic specialist at their home base and decided to re-activate the number 2 hydraulic pump to provide the aircraft with complete hydraulic capability. Fuel dumping was instituted and the aircraft recovered safely at Fairchild AFB.

Upon inspection of the aircraft following the flight, maintenance discovered air leaks in the right hydraulic system accumulator and in the boom accumulator. A V-band clamp had loosened in the number 3 engine strut, allowing hot bleed air to leak and overheat the right hydraulic system fluid. The number 1 hydraulic pump was found to be inoperative and the forward air refueling pump in the aft body fuel tank had an internal hydraulic leak which caused the number 2 hydraulic pump to malfunction. Crew E-112's professional performance in this hazardous in-flight situation reflects their in-depth systems knowledge and the sound judgement which resulted in the safe recovery of a valuable SAC aircraft and crew.

Crew E-112, 92d Bombardment Wing, Fairchild AFB: (L-R Top) Capt Hector Rodriguez, pilot; Capt Eugene H. Weitzel, IN; (L-R Bottom) 1Lt Thomas N. Mouch, CP, Sgt Michael D. Cardina, BO. Not pictured: Capt Dana C. Durkee, navigator.

MAINTENANCE AIRMAN

SrA Phyllis Wilson, 43 OMS, 43d SW, Andersen AFB is selected SAC Maintenance Airman of the Month. SrA Wilson is highly professional and possesses tremendous technical ability and desire. Since her assignment to OMS, she has never had a failed evaluation. She was personally responsible for a zero defect preflight inspection rated outstanding by quality control and for another preflight inspection rated excellent. She far exceeds the standards and expections of today's young airman. Her outstanding performance and dedication make her a valuable member of her unit, the Strategic Air Command and the United States Air Force.

HALL OF FAME

TACTICAL FLYING

OVER TWENTY-FOUR YEARS

170 AREFG, McGuire (NJANG)	None

OVER TWENTY-TWO YEARS

171 AREFW, Greater Pittsburgh (PAANG)	Mar '58
157 AREFG, Pease (NHANG)	June '58
97 BMW, Blytheville	Aug '58

OVER TWENTY-ONE YEARS

940 AREFG, Mather (USAFR)	May '59
307 AREFG, Travis	Sep '59

OVER NINETEEN YEARS

151 AREFG, Salt Lake City (UTANG)	Feb '61
161 AREFG, Sky Harbor (AZANG)	Apr '61
126 AREFW, Chicago O'Hare (ILANG)	Apr '61
134 AREFG, McGhee Tyson (TNANG)	Aug '61

OVER EIGHTEEN YEARS

11 SG, Fairford	Feb '62
340 AREFG, Altus	Jun '62
96 BMW, Dyess	Aug '62

OVER SEVENTEEN YEARS

19 BMW, Robins	Aug '63

OVER SIXTEEN YEARS

160 AREFG, Rickenbacker (OHANG)	Dec '64

OVER FIFTEEN YEARS

920 BMW, Mather	Jul '65

OVER THIRTEEN YEARS

92 BMW, Fairchild	Feb '67
55 SRW, Offutt	Jul '67
2 BMW, Barksdale	Aug '67

OVER ELEVEN YEARS

5 BMW, Minot	Feb '69
42 BMW, Loring	Sep '69
141 AREFW, Fairchild (WAANG)	Oct '69

OVER TEN YEARS

28 BMW, Ellsworth	May '70

OVER EIGHT YEARS

7 BMW, Carswell	Mar '72
101 AREFW, Bangor (MEANG)	Mar '72
306 SW, Mildenhall	Apr '72
416 BMW, Griffiss	May '72
305 AREFW, Grissom	Aug '72

OVER SEVEN YEARS

379 BMW, Wurtsmith	Apr '73

OVER SIX YEARS

931 AREFG, Grissom (USAFR)	Feb '74
384 AREFW, McConnell	Mar '74
189 AREFG, Little Rock (ARANG)	May '74
43 SW, Andersen	Dec '74

OVER FIVE YEARS

68 BMW, Seymour Johnson	Sep '75
6 SW, Eielson	Dec '75

ICBM

OVER SIXTEEN YEARS

1 STRAD, Vandenberg	Sep '64

OVER TEN YEARS

341 SMW, Malmstrom	Apr '70

OVER SEVEN YEARS

390 SMW, Davis-Monthan	Jul '73

OVER SIX YEARS

351 SMW, Whiteman	Oct '74
91 SMW, Minot	Nov '74

OVER FOUR YEARS

321 SMW, Grand Forks	Feb '76

To gain listing in the Hall of Fame, a SAC or ARF unit must be Class A mishap-free for 48 months.

SAC SAFETY SCREEN

5 BMW, Minot Crew S-02: P Capt John H Wayne Jr, CP Capt Richard B Sorenson, RN Capt Thomas E. Albertazzie, N 1Lt Bradley R Nord, EW 1Lt John E Remisovsky, G SrA Joseph E Lucia

319 BMW, Grand Forks Crew S-10: P Maj Kermit Erickson, CP 1Lt Gary Kopacka, RN Maj Dave Dick, N 1Lt Craig Morris, EW 1Lt Steve Peters, G Sgt Don Leake

319 BMW, Grand Forks Crew E-11: P Maj Jim Page, CP 1Lt Bill Maisch, RN Capt Tom Newbold, N 1Lt Joseph Poznik, EW Maj Wayne Baird, G SSgt Ricky Silvis

319 BMW, Grand Forks Crew S-113: P Maj Nick Carter, CP 1Lt Todd Carrillo, N 1Lt Gary Ellsworth, BO SrA Bob Dunning

319 BMW, Grand Forks Crew R-112: P Capt Dane Martin, CP 1Lt Bob Aboe, N Lt Col Warren Johnson, BO Amn Dave Makin

319 BMW, Grand Forks Crew R-116: P Capt Wayne Eastham, Cp 1 Lt Ray Stratton, N Capt Steve Bird, BO Sgt Clyde Hampton

101 AREFW (ANG), Bangor Intl Airport, Crew: P Capt Alfred G Jenkins, CP 2Lt John L D'Errico, N Capt John G Cozad, BO MSgt Roger C MacLeod

2 BMW, Barksdale Crew R-05: P Capt Patrick J Rooney, CP Capt Larry A Weaver, RN Capt Gilbert Lugo, N Capt Thomas C Fugate Jr, EWO 1Lt David A Reese, G A1C Clinton D Coleman

2 BMW, Barksdale Crew R-65: P Capt Grover E Myers III, CP Capt Michael F Siebert, RN Capt William J Riggle, N Capt Jerry A Fulgam, EWO 1Lt Thomas G Howse, G SSgt David C Donatto

2 BMW, Barksdale Crew R-106: P Capt Rudee F Davis, CP 1Lt Roderick D Thornton, N Capt Jay L Lorenzen, BO Sgt Dewayne C Littleton

2 BMW, Barksdale Crew R-158: P Capt Eugene F Barton, CP 1Lt Gregory J Peterson, N 1Lt John H Firebaugh, BO Sgt William H Fordyce

340 AREFG, Altus Crew R-122: P Capt Charles B Kenley, CP Capt William J Hoppe, N Lt Sandford N Eubanks, BO TSgt Walter Schlief

7 BMW, Carswell Crew E-14: P Capt Benjamin W Jubela, CP 1Lt Thomas D Jones, RN Capt David T Weber, N Capt David N Browning, EWO Capt Michael L Leeper, G SSgt Michael S Sullivan

7 BMW, Carswell Crew E-83: P Capt Lawrence A Loeffler, CP 1Lt Jeffrey K Hauser, RN Capt Hubert D Murdock, N 1Lt Joseph C Howard, EWO 1Lt Robert C Franklin, G Sgt Stephen A Ray

7 AREFS, Carswell Crew E-115: P Capt Lewis D Flowers, CP 1Lt Michael J McGovern, N 1Lt John C Hinds, BO Sgt John A Grunseich

909 AREFS, Kadena Crew R-112: P Capt James A Vogelgesang, CP 1Lt Cyril K Haines, IN Capt William S Fischer, IS TSgt Richard R Fillion

90 SMW, Minot Crew R-017: MCCC Capt Johnnie A Hall Jr, DMCCC 2 Lt Thomas C Trauba

341 SMW, Malmstrom Crew R-137: MCCC 1Lt Timothy R Whitacre, DMCCC 2Lt Randy L. Whipple

321 SMW, Grand Forks Crew E-100: MCCC Capt Alan Sarkan, DMCCC 2Lt Thomas Conner

351 SMW, Whiteman Crew S-072: MCCC Capt Brian G Millburn, DMCCC 2Lt Marshall A Wallace

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